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### Treatment of Vegetable Substances to Obtain Alcoholic Liquids.

LETTERS PATENT to Christopher Rands, of Holloway, in the County of Middlesex, Gentleman, for the Invention of "IMPROVEMENTS IN THE TREATMENT OF VEGETABLE SUBSTANCES FOR THE PURPOSE OF OBTAINING ALCOHOLIC LIQUIDS THEREFROM."

Sealed the 8th May 1877, and dated the 25th November 1876.

PROVISIONAL SPECIFICATION left by the said Christopher Rands at the Office of the Commissioners Patents on the 25th November 1876.

CHRISTOPHER RANDS, of Holloway, in the County of Middlesex, Gentleman.  
"IMPROVEMENTS IN THE TREATMENT OF VEGETABLE SUBSTANCES FOR THE PURPOSE  
5 OF OBTAINING ALCOHOLIC LIQUIDS THEREFROM."

The object of my Invention is to improve the fermentation in the process of manufacturing beer, wine, and other alcoholic liquids, and thereby to increase the yield of alcohol.

By the treatment I propose the fermentation is carried on more rapidly than  
10 usual, but at the same time without the liability to run to acid fermentation, a result which would otherwise follow.

In carrying out my Invention I add to the substances under treatment, and preferably before the fermentation sets in, phosphate of ammonia, either in the form of concentrated solution or in crystals, and in the proportion of about 1 lb. of  
15 phosphate to from 50 to 60 bushels of grain, or the equivalent quantity of liquor or wort.

In brewing the phosphate may be added either to the wort or to the ferment, and a less proportion of yeast may be used than usual, or if preferred the phosphate may be added to the water in which the grain is steeped previous to malting,  
20 in which case the germination will be hastened and the ultimate fermentation improved.

For distillation the phosphate is added to the wort or mash, as before described, and the attenuation is carried on more quickly and to a greater extent than is usual, without the liability of acid fermentation being set up.

[Price 2d.]



*Rands' Impts. in the Treatment of Vegetable Substances to Obtain Alcoholic Liquids.*

SPECIFICATION in pursuance of the conditions of the Letters Patent filed by the said Christopher Rands in the Great Seal Patent Office on the 23rd May 1877.

CHRISTOPHER RANDS, of Holloway, in the County of Middlesex, Gentleman.  
"IMPROVEMENTS IN THE TREATMENT OF VEGETABLE SUBSTANCES FOR THE PURPOSE  
OF OBTAINING ALCOHOLIC LIQUIDS THEREFROM." 5

The object of my Invention is to improve the action of fermentation in the process of manufacturing beer and other alcoholic liquids, and thereby to increase the yield of alcohol.

By the treatment I propose the fermentation may be carried on more rapidly 10 and to a greater attenuation than usual, as the yeast is nourished and kept healthy, while at the same time the liability to run to acid fermentation (now a frequent result, especially in the fermentation of liquids for distilling) is obviated.

In carrying out my Invention I add to the substance to be operated upon (and preferably before the fermentation sets in) phosphate of ammonia, either in the form 15 of crystal or in solution, and in the proportion of about one pound of phosphate to from fifty to sixty bushels of grain, according to the nature of the grain or the equivalent quantity of liquor or wort.

In the process of brewing the phosphate may be added either to the wort or to the ferment or yeast, and a less proportion of yeast may be used than is usual, and 20 the phosphate may be added to any of the saccharine matters used in brewing, such as ordinary sugar saccharum glucose; or it may be mixed with any of the extracts or decoctions now used and known as hop substitutes. If preferred the phosphate may be added to the water in which the grain is steeped previous to malting, in which case the ultimate fermentation of the malt will be greatly improved. 25

For the process of distillation the phosphate is added to the wort, or to the mash, or to the yeast or ferment, in either of the modes before described, and the attenuation will be more rapid and carried to a greater extent than usual, without the liability of acid fermentation being set up, at the same time producing a large increase in the yield of spirit. 30

Having now set forth the nature of my Invention of "Improvements in the Treatment of Vegetable Substances for the Purpose of Obtaining Alcoholic Liquids therefrom," and having explained the manner of carrying the same into effect, I wish it to be understood that under the above in part recited Letters Patent I do not intend to confine myself to the exact proportions above stated, but what I 35 claim is, treating solutions from which alcoholic liquids are produced, or vegetable substances from which alcoholic liquids are obtained, with phosphate of ammonia, as and for the purposes herein set forth.

In witness whereof, I, the said Christopher Rands, have hereunto set my hand and seal, the Twenty-third day of May, in the year of our Lord One thousand 40 eight hundred and seventy-seven.

CH<sup>R</sup>. RANDS. (L.S.)